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IN THE UNITED STATES PATENT & TRADEMARK OFFICE

IN RE APPLICATION OF	:
YASUHIRO KABU, ET AL.	: EXAMINER: WEISZ, D. G.
SERIAL NO: 10/564,503	:
FILED: JANUARY 13, 2006 RCE FILED: MARCH 2, 2010	: GROUP ART UNIT: 1777
FOR: METHOD FOR SUPPLYING REACTION GASES IN CATALYTIC VAPOR PHASE OXIDATION PROCESS	:

SECOND APPEAL BRIEF

COMMISSIONER FOR PATENTS
ALEXANDRIA, VIRGINIA 22313

SIR:

This is an appeal of the Rejection dated March 14, 2011 of twice-rejected Claims 1, 3, 4 and 6-10. A Notice of Appeal is **submitted herewith**.

I. REAL PARTY IN INTEREST

The real party in interest in this appeal is Mitsubishi Rayon Co., Ltd. having an address at 6-41, Konan 1-chome, Minato-ku, Tokyo, Japan 108-8506.

II. RELATED APPEALS AND INTERFERENCES

Appellants, Appellants' legal representative and the assignee are aware of no appeals or interferences which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF THE CLAIMS

Claims 1, 3, 4 and 6-10 stand rejected and are herein appealed. Claims 2 and 5 have been canceled.

IV. STATUS OF THE AMENDMENTS

No amendment under 37 CFR 1.116 has been filed. However, an amendment under 37 CFR 1.111 is filed with the Notice of Appeal and this Appeal Brief. The CLAIMS APPENDIX herein assume entry of the amendment.

V. SUMMARY OF THE CLAIMED SUBJECT MATTER

A summary of the claimed subject matter, as claimed in independent Claims 1 and 6, is mapped out below, with reference to page and line numbers in the specification added in **[bold]** after each element:

Claim 1. A method for supplying reaction gases in a catalytic gas-phase oxidation reaction in which at least a material to be oxidized and a gas containing molecular oxygen are mixed and the resultant mixture is supplied to a catalytic gas-phase oxidation reactor, wherein a feed rate of the material to be oxidized and a feed rate of the gas containing molecular oxygen are adjusted so that when a composition of a gas at the inlet of the catalytic gas-phase oxidation reactor is changed from a reactive composition A point, which is the concentration

of the material to be oxidized: R(a), and the concentration of oxygen: O(a) represented by plotting a concentration of the material to be oxidized and a concentration of oxygen in the gas at said inlet to a reactive composition B point, which is the concentration of the material to be oxidized: R(b), and the concentration of oxygen: O(b), with a proviso that the composition A point and the composition B point are compositions outside a range in which the material to be oxidized and oxygen possibly react to cause explosion, which range is an explosion range, and $R(a) \neq R(b)$ and $O(a) \neq O(b)$, compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range, **[page 2, line 22 to page 3, line 11]** wherein the material to be oxidized is isobutylene, tertiary butyl alcohol or methacrolein, **[page 6, lines 2-3]** wherein one of the feed rates of the material to be oxidized and the gas containing molecular oxygen is adjusted in advance by increasing it or decreasing it to the direction away from the explosion range and then the other feed rate is adjusted by increasing it or decreasing it to reach to the composition B point so that the compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range. **[page 6, lines 8-14]**

Claim 6. A computer-readable medium which makes a computer function as a means for showing on a display a compositional range which, in the case at least a material to be oxidized and a gas containing molecular oxygen are mixed, possibly reacts to cause an explosion, which range is an explosion range, **[page 12, lines 11-23]** and as a means for showing on the display a compositional point which is represented by plotting the measured values of concentration of the material to be oxidized and oxygen in a gas at the inlet of a catalytic gas-phase oxidation reactor as well as the explosion range, **[page 12, lines 5-10]** wherein one of the feed rates of the material to be oxidized and the gas containing molecular

oxygen is adjusted in advance from a reactive composition A point by increasing it or decreasing it to the direction away from the explosion range and then the other feed rate is adjusted by increasing it or decreasing it to reach to a reactive composition B point so that the compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range. **[page 6, lines 8-14]**

VI. GROUNDS OF REJECTION

Ground (A)

Claims 1, 3-4 and 6-10 stand rejected under 35 U.S.C. § 102(e) as anticipated by US 2004/0015012 (Hammon et al).

Ground (B)

Claims 1, 3-4 and 6-10 stand rejected under 35 U.S.C. § 112, 2nd paragraph, as indefinite.

VII. ARGUMENT

Ground (A)

Claims 1, 3-4 and 6-10 stand rejected under 35 U.S.C. § 102(e) as anticipated by Hammon et al. That rejection is untenable and should not be sustained.

Claim 1 is drawn to a method for supplying reaction gases in a catalytic gas-phase oxidation reaction in which at least a material to be oxidized and a gas containing molecular oxygen are mixed and the resultant mixture is supplied to a catalytic gas-phase oxidation reactor, wherein a feed rate of the material to be oxidized and a feed rate of the gas containing molecular oxygen are adjusted so that when a composition of a gas at the inlet of

the catalytic gas-phase oxidation reactor is changed from a reactive composition A point, which is the concentration of the material to be oxidized: R(a), and the concentration of oxygen: O(a) represented by plotting a concentration of the material to be oxidized and a concentration of oxygen in the gas at said inlet to a reactive composition B point, which is the concentration of the material to be oxidized: R(b), and the concentration of oxygen: O(b), with a proviso that the composition A point and the composition B point are compositions outside a range in which the material to be oxidized and oxygen possibly react to cause explosion, which range is an explosion range, and $R(a) \neq R(b)$ and $O(a) \neq O(b)$, compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range, wherein the material to be oxidized is isobutylene, tertiary butyl alcohol or methacrolein, wherein one of the feed rates of the material to be oxidized and the gas containing molecular oxygen is adjusted in advance by increasing it or decreasing it to the direction away from the explosion range and then the other feed rate is adjusted by increasing it or decreasing it to reach to the composition B point so that the compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range.

Claim 6 is drawn to a related embodiment, which is a computer-readable medium.

Thus, the present invention is characterized by increasing or decreasing a feed rate of a gas, and then increasing or decreasing a feed rate of another gas **without shutting off a feed**.

Hammon et al discloses a process in which a feed of gas streams is automatically stopped by a computer system if the distance from the operating point to the nearest explosion limit is below a predetermined minimum value [0058]-[0062], while the present invention instead increases or decreases a feed rate of a gas, and then increases or decreases a

feed rate of another gas, in order to make a detour as shown in present Fig. 1 and thereby safely avoid an explosion on increase or decrease of an operating load.

The Examiner finds that Hammon et al anticipates the presently-claimed invention, finding that the term "reactive composition" is not defined in the specification and, giving the specification its broadest reasonable interpretation, the term is inclusive of the feed being shut off, because a reactive composition already present in a reaction chamber is capable of participating in an oxidation reaction before, during and immediately after the feed was shut off.

In reply, Hammon et al does not disclose increasing or decreasing a feed rate of a gas, **and** then increasing or decreasing a feed rate of another gas, in order to, in effect, safely avoid a potential explosion, which is also a feature of the present claims. Moreover, to suggest that the present claims are broad enough to be inclusive of shutting off a feed may be broad, but it is not a reasonable interpretation of the specification. Indeed, the term "reactive composition" is at least implicitly supported by any of Figs. 1-4 and corresponding disclosure, which show that the claimed method is performed continuously from point A to point B without shutting off the feed of either the material to be oxidized or the gas containing molecular oxygen.

For all the above reasons, it is respectfully requested that this rejection be REVERSED.

Ground (B)

Claims 1, 3-4 and 6-10 stand rejected under 35 U.S.C. § 112, 2nd paragraph, as indefinite. That rejection is untenable and should not be sustained.

The basis for the rejection is that the presence of brackets and parentheses make it unclear whether the bracketed and parenthetical language are claim limitations, and the content of the variables are unclear, as the concentrations and compositions are never explicitly defined and thus, the variables could be interpreted to be any composition or concentration.

In reply, Claim 1 and 6 have been amended by deleting brackets and parentheses and inserting appropriate language and punctuation, indicating that the first two sets of bracketed language were definitions of what was meant by composition point A and composition point B, respectively; the bracketed language containing the "proviso" is a claim limitation; and the parenthetical language represented a short-hand abbreviation of composition points A and B which could possibly react to cause an explosion. Regarding the definition of concentrations and compositions, the only relevant concentrations and compositions are those in the explosion range and those not in the explosion range.

For all the above reasons, it is respectfully requested that this rejection be REVERSED.

VIII. CONCLUSION

For the above reasons, it is respectfully requested that the rejection be REVERSED.

Respectfully submitted,

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CLAIMS APPENDIX

Claim 1. A method for supplying reaction gases in a catalytic gas-phase oxidation reaction in which at least a material to be oxidized and a gas containing molecular oxygen are mixed and the resultant mixture is supplied to a catalytic gas-phase oxidation reactor, wherein a feed rate of the material to be oxidized and a feed rate of the gas containing molecular oxygen are adjusted so that when a composition of a gas at the inlet of the catalytic gas-phase oxidation reactor is changed from a reactive composition A point, which is the concentration of the material to be oxidized: R(a), and the concentration of oxygen: O(a) represented by plotting a concentration of the material to be oxidized and a concentration of oxygen in the gas at said inlet to a reactive composition B point, which is the concentration of the material to be oxidized: R(b), and the concentration of oxygen: O(b), with a proviso that the composition A point and the composition B point are compositions outside a range in which the material to be oxidized and oxygen possibly react to cause explosion, which range is an explosion range, and $R(a) \neq R(b)$ and $O(a) \neq O(b)$, compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range, wherein the material to be oxidized is isobutylene, tertiary butyl alcohol or methacrolein, wherein one of the feed rates of the material to be oxidized and the gas containing molecular oxygen is adjusted in advance by increasing it or decreasing it to the direction away from the explosion range and then the other feed rate is adjusted by increasing it or decreasing it to reach to the composition B point so that the compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range.

Claim 3. The method for supplying reaction gases in the catalytic gas-phase oxidation reaction according to claim 1, wherein in the case there exists the composition C point [the concentration of the material to be oxidized: R(c), and the concentration of oxygen: O(c),

wherein O(c) < O(a), O(c) < O(b) and R(b) > R(c) > R(a) or R(a) > R(c) > R(b)] of the lowest oxygen concentration of an explosion limit in the explosion range, a feed rate of the material to be oxidized and a feed rate of the gas containing molecular oxygen are adjusted so that compositions on the way of the change from the composition A point to the composition B point pass through the composition C' point [the concentration of the material to be oxidized: R(c'), and the concentration of oxygen: O(c'), wherein R(c') = R(c) and O(c') < O(c)].

Claim 4. The method for supplying reaction gases in the catalytic gas-phase oxidation reaction according to claim 1, wherein the range in which the material to be oxidized and oxygen possibly react to cause explosion (the explosion range) and a present compositional point represented by plotting concentrations of the material to be oxidized and oxygen in the gas at the inlet of the catalytic gas-phase oxidation reactor are shown and monitored on a display.

Claim 6. A computer-readable medium which makes a computer function as a means for showing on a display a compositional range which, in the case at least a material to be oxidized and a gas containing molecular oxygen are mixed, possibly reacts to cause an explosion, which range is an explosion range, and as a means for showing on the display a compositional point which is represented by plotting the measured values of concentration of the material to be oxidized and oxygen in a gas at the inlet of a catalytic gas-phase oxidation reactor as well as the explosion range, wherein one of the feed rates of the material to be oxidized and the gas containing molecular oxygen is adjusted in advance from a reactive composition A point by increasing it or decreasing it to the direction away from the explosion range and then the other feed rate is adjusted by increasing it or decreasing it to reach to a

reactive composition B point so that the compositions on the way of the change from the composition A point to the composition B point fall outside the explosion range.

Claim 7. The method of supplying reaction gases in the catalytic gas-phase oxidation reaction according to claim 1, wherein the material to be oxidized is isobutylene.

Claim 8. The method of supplying reaction gases in the catalytic gas-phase oxidation reaction according to claim 1, wherein the material to be oxidized is tertiary butyl alcohol.

Claim 9. The method of supplying reaction gases in the catalytic gas-phase oxidation reaction according to claim 1, wherein the material to be oxidized is methacrolein.

Claim 10. The method of supplying reaction gases in the catalytic gas-phase oxidation reaction according to claim 1, wherein the change from the composition A point to the composition B point is carried out through multiple composition points.

EVIDENCE APPENDIX

None.

RELATED PROCEEDINGS APPENDIX

None.